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10/662,007	09/11/2003	Everett A. Corl JR.	RPS920020032US1	8599

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EXAMINER	
WEINTROP, ADAM S	
ART UNIT	PAPER NUMBER
2109	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/28/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/662,007	CORL ET AL.	
	Examiner	Art Unit	
	Adam S. Weintrop	2109	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-35 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-35 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 11 September 2003 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date 9/11/03 2/18/05.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities:

The use of the term "ISO" to describe the network model is incorrect and all of these terms should be replaced with – OSI – to make use of the Open Systems Interconnection Reference Model.

The term "catch" on line 5 of page 5 is misspelled and should be replaced with – cache --.

Appropriate correction is required.

Claim Objections

2. **Claims 1-10, and 25** are objected to because of the following informalities:

Regarding **claim 1**, the phrase "at least one packet" in line 6 should be replaced with – at least one of the packets – to establish proper antecedent basis. The phrase "said received packet characteristics" on line 7 has not been defined and should be replaced with – received packet characteristics --. The phrase "the characteristics" on line 9 should be replaced with – the received packet characteristics --. The phrase "said received packets" on line 9 has not been defined and should be replaced with – received packets --. Also, the term "the correlation" on line 11 has not been defined and should be replaced with – the correlating step --. The phrase "the received packet" on line 11 has not been defined and should be replaced with – a received packet --.

Regarding **claim 2**, the phrases "the received packet" and "said received packet" on line 13 have not been defined and the first phrase should be replaced with – a received packet --.

Regarding **claim 5**, the term "the acts" in line 19 should be replaced with – acts -- . The term "packets" on line 2 should be replaced with – the packets – to establish proper antecedent basis.

Regarding **claim 9**, the term "the stored action" on line 11 is singular and needs to be replaced with – the stored actions – to establish proper antecedent basis.

Regarding **claim 25**, the term "instructions" on line 3 should be replaced with – the instructions--.

Appropriate correction is required.

Claim Rejections - 35 USC § 101

3. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 23-26 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Claim 23 is directed towards a program product including a medium on which a computer program is recorded with instructions thereon. A computer program alone is non-statutory subject matter, being non-functional descriptive material. In order for a claim to be statutory, it has to be a system, method, manufacture, or composition of matter, and produce concrete, tangible, and

useful results. A computer program alone does not fall into a statutory category of invention and does not produce result alone. Dependent claims 24-26 are rejected for the same.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. **Claims 1-7, 9-10, and 22-29** are rejected under 35 U.S.C. 102(b) as being anticipated by Zenchelsky et al. (US 6,173,364 B1).

Regarding **claim 1**, Zenchelsky et al. discloses a method for managing traffic in a communications network comprising acts of: (a) providing, in a network device, a cache containing at least predefined characteristics associated with packets and actions paired with selected ones of said predefined characteristics (column 3, lines 63-67 and column 4, lines 1-2, where the key is a predefined characteristic and actions are paired together with it in the cache, the cache being used for filtering packets in a communication network, and is in a network device as seen in column 1, lines 51-59, a network device being a filter); (b) receiving at least one packet in said network device (column 1, lines 60-62); (c) selecting from said received packet characteristics similar to the at least predefined characteristics (column 1, lines 60-66); (d) correlating the characteristics selected from said received packet with the predefined

characteristics (column 4, lines 2-6); and (e) using results from the correlation to process the received packet (column 4, lines 6-8).

Regarding **claim 2**, Zenchelsky et al. discloses the method of claim 1 wherein the process includes enforcing the paired action against the received packet if the characteristics of said received packet matches the at least predefined characteristics (column 4, lines 6-8).

Regarding **claim 3**, Zenchelsky et al. discloses the method of claim 1 or claim 2 wherein the at least predefined characteristics include Internet Protocol (IP) Destination Address (DA), IP Source Address (SA), Transmission Control Protocol (TCP) Destination Port (DP) and TCP Source Port (SP) (column 2, lines 1-25, with the filtering being based on source address and port and destination address and port).

Regarding **claim 4**, Zenchelsky et al. discloses the method of claim 1 wherein the correlating act includes comparing (column 4, lines 2-3, wherein matching is equivalent to comparing).

Regarding **claim 5**, Zenchelsky et al. discloses a method comprising the acts of: providing in a memory a mapping of predefined characteristics associated with packets and actions to be performed (column 3, lines 63-67 and column 4, lines 1-2, where the keys are predefined characteristics and the action are paired together in the memory); receiving packets to be classified (column 4, lines 2-3); correlating selected characteristics of received packets with the predefined characteristics (column 4, lines 2-4); and performing stored actions on said received packets, if the selected characteristics match the predefined characteristics (column 4, lines 6-8).

Regarding **claim 6**, Zenchelsky et al. discloses the method of claim 5 wherein the correlating act includes comparing (column 4, lines 2-3, wherein matching is equivalent to comparing).

Regarding **claim 7**, Zenchelsky et al. discloses the method of claim 5 wherein the predefined characteristics include Source Address (SA), Destination Address (DA), Source Port (SP), and Destination Port (DP) (column 2, lines 1-25, with the filtering being based on source address and port and destination address and port).

Regarding **claim 9**, Zenchelsky et al. discloses the method of claim 5 wherein the stored actions associated with predefined characteristics are updated only from a first packet of a group of packets (column 3, lines 65-67 to column 4, lines 1-2, where a filter rules are applied only to a first packet in a message that shares a same key and the cache is updating only from the filter rule base).

Regarding **claim 10**, Zenchelsky et al. discloses the method of claim 9 wherein the stored actions are being performed on all packets following the first packet of the group of packets (column 4, lines 8-10).

Regarding **claim 22**, Zenchelsky et al. discloses a system including a memory that stores a mapping between predefined characteristics of packets and actions to be performed for a subset of the set of all characteristic values (column 3, lines 63-67, where the key is the predefined characteristic paired with an action, and the memory is derived from a filter rule base, therefore containing a subset of characteristics derived from already received packets); and a controller that correlates characteristics in a received packet with the predefined characteristics and performing the actions on said

received packet if the characteristics match the predefined characteristics (column 4, lines 2-8, where the received packet is searched against the predefined characteristics and the paired action is applied to the packet if a match is found).

Regarding **claim 23**, Zenchelsky et al. discloses a program product including a medium on which a computer program is recorded, said program including instructions that correlate characteristics of a received packet with characteristics in a table (column 4, lines 2-4, where a cache memory is searched for a matching entry, seen as characteristics in a table, when a packet is received), said table containing a subset of all possible characteristic values (column 3, lines 63-67, where the cache memory is derived from a filter rule base, therefore containing a subset of characteristics derived from already received packets); and instructions to enforce an action stored in said table on the received packet if the characteristics of the received packet and the characteristics in the table match (column 4, lines 6-8, where the received packet is searched against the predefined characteristics and the paired action is applied to the packet if a match is found).

Regarding **claim 24**, Zenchelsky et al. discloses the program product of claim 23 further including instructions to generate the table containing the characteristics and associated actions (column 3, lines 63-67 and column 4, lines 1-2, where generating the table consists of adding a cache entry for each first packet received).

Regarding **claim 25**, Zenchelsky et al. discloses the program product of claim 24 further still including instructions to maintain the table (column 5, lines 1-12, where using the version numbers to eject outdated session entries is seen as maintaining the table).

Regarding **claim 26**, Zenchelsky et al. discloses the program product of claim 25 wherein the instructions to maintain further includes instruction to delete aged entries and insert new entries (column 5, lines 35-39).

Regarding **claim 27**, Zenchelsky et al. discloses the method of claim 1 wherein the at least one packet received in (b) satisfies a Frequent Flyer criteria of being one packet within a short burst of packets belonging to the same session (column 4, lines 1-6, where the first packet received is part of a series of packets with the same key).

Regarding **claim 28**, Zenchelsky et al. discloses the system of claim 22 further including aging mechanism operatively coupled to the memory, said aging mechanism periodically deleting old entries from said memory (column 5, lines 35-39, where the aging mechanism is seen as the process that deletes the entries, which would have to have access to the memory itself).

Regarding **claim 29**, Zenchelsky et al. discloses the system of claim 28 wherein old entries are being deleted based upon a predefined criteria (column 5, lines 1-11, with the predefined criteria being the version number).

6. **Claims 11-13 and 31-32** are rejected under 35 U.S.C. 102(b) as being anticipated by Hughes et al. (US 5,842,040).

Regarding **claim 11**, Hughes et al. discloses a system including a processor (column 2, lines 54-57); and a cache operatively coupled to said processor (column 3, lines 36-39), said cache storing a mapping between predefined characteristics of packets and actions wherein said processor executes a first program that causes said processor to correlate characteristics of selected packets with the predefined

characteristics (column 2, lines 57-60, where the policy is selected from a plurality of policies matched to the received PDU packet, these policies being seen as equivalent to characteristics of packets) and enforcing on said selected packets actions associated with predefined characteristics if characteristics from the selected packets match the predefined characteristics (column 3, lines 5-9, where the PDU has a policy applied to it from the policy cache).

Regarding **claim 12**, Hughes et al. discloses the system of claim 11 wherein the predefined characteristics include Source Address (SA), Destination Address (DA), Source Port (SP) and Destination Port (DP) (column 5, lines 30-45, with the policies including filtering based on these criteria or any combination of criteria).

Regarding **claim 13**, Hughes et al. discloses the system of claim 11 wherein the processor includes a network processor (column 2, lines 50-57, with any network device including a processor can perform this process).

Regarding **claim 31**, Hughes et al. discloses a method of classifying packets in a communications network comprising acts of: (a) receiving packets in a network device (column 2, line 61); (b) determining data packets present in received packets (column 3, lines 15-24, with grouping the packets together by any field could include TCP flag information as seen in column 5, lines 34-44, and this classification can inherently determine if it's a data packet or a non-data packet (data packets do not set the Synchronize flag or the Finish flag)); (c) providing a cache in which predefined characteristics of packets and actions associated with selected ones of the predefined characteristics are stored (column 3, lines 36-39, where policy data is seen as

predefined characteristics); for each data packet so determined, correlating selected characteristics of said each data packet with the predefined characteristics in said cache (column 3, lines 27-31); and for each data packet with selected characteristics matching one of the predefined characteristics imposing on said each data packet the action associated with said one of the predefined characteristics (column 3, lines 30-35, where policies are applied to matching packets with the matching policy information).

Regarding **claim 32**, Hughes et al. discloses the method of claim 31, wherein the packets include TCP/IP packets (column 14, lines 14-18).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. **Claim 8** is rejected under 35 U.S.C. 103(a) as being unpatentable over Zenchelsky et al. (US 6,173,364 B1) in view of Hughes et al. (US 5,842,040).

Regarding **claim 8**, Zenchelsky et al. discloses all of the limitations as described above. Zenchelsky et al. does not disclose using data packets. The general concept of using data packets with a caching system is well known in the art as illustrated by Hughes et al. Hughes et al. discloses using data packets in his caching system that applies policies to data units that are sent through the system (column 2, lines 43-49, where a PDU is a protocol data unit and is seen as a data packet). It would have been

obvious to one of ordinary skill in the art at the time of invention to modify Zenchelsky et al. with using data packets as taught by Hughes et al. in order to use all kinds of packets as to increase system compatibility.

9. **Claims 14-15** are rejected under 35 U.S.C. 103(a) as being unpatentable over Hughes et al. (US 5,842,040) in view of Guide to IP Layer Network Administration with Linux - Routing Cache.

Regarding **claims 14 and 15**, Hughes et al. discloses all of the limitations as described above including having the packets used for caching include received packets as required by claim 15 (column 2, lines 63-65, with a PDU being a packet received). Hughes et al. does not disclose having a memory with a data structure stored thereon for a full packet search wherein a second program causes the processor to access the data structure and imposing in the selected packet an action stored in the data structure if a mismatch occurs between the predefined characteristics and the characteristics from the selected packets. The general concept of accessing a table to find an action for a packet if a mismatch occurs within the cache structure is well known in the art as illustrated by the Guide to IP Layer Network Administration. The Guide to IP Layer Network Administration discloses a routing cache scheme where the cache is consulted for a packet action before a routing table is consulted, and if the action is in the cache, that action will be performed (Chapter 4.7). This implies that if the cache does not contain the necessary information, a routing table will be searched for the action for the packet. It would have been obvious to one of ordinary skill in the art at the time of invention to modify Hughes et al. with searching a routing table in a memory if

the cache did not match correctly to the current packet as taught by the Guide to IP Layer Network Administration in order to use routing tables in addition to routing cache as to be able to route packets the device has not routed before.

10. **Claims 16-21** are rejected under 35 U.S.C. 103(a) as being unpatentable over Hughes et al. (US 5,842,040) and Guide to IP Layer Network Administration with Linux - Routing Cache as applied to claims 14-15 above, and further in view of Bass et al. (US 6,460,120 B1).

Regarding **claim 16**, Hughes et al. and the Guide to IP Layer Network Administration disclose all of the limitations as described above except for using a full match algorithm to search the table. The general concept of using a full match algorithm is well known in the art as illustrated by Bass et al. Bass et al. discloses frame lookups in a table using a fixed match tree (column 8, lines 1-3, where a fixed match tree requires an exact match, which is seen as being equivalent to a full match). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Hughes et al. and the Guide to IP Layer Network Administration with using a full match search algorithm as taught by Bass et al. in order to use known search algorithms to increase lookup speed of a packet.

Regarding **claim 17**, Hughes et al. and the Guide to IP Layer Network Administration disclose all of the limitations as described above except for using a longest prefix match algorithm to search the table. The general concept of using a longest prefix match algorithm is well known in the art as illustrated by Bass et al. Bass et al. discloses frame lookups in a table using a longest prefix match tree (column 8,

lines 1-5). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Hughes et al. and the Guide to IP Layer Network Administration with using a longest prefix match search algorithm as taught by Bass et al. in order to use known search algorithms to increase lookup speed of a packet.

Regarding **claim 18**, Hughes et al. and the Guide to IP Layer Network Administration disclose all of the limitations as described above except for using software managed tree algorithm to search the table. The general concept of using a software managed tree algorithm is well known in the art as illustrated by Bass et al. Bass et al. discloses frame lookups in a table using a software-managed tree (column 8, lines 1-8). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Hughes et al. and the Guide to IP Layer Network Administration with using a software managed tree search algorithm as taught by Bass et al. in order to use known search algorithms to increase lookup speed of a packet.

Regarding **claims 19 and 20**, Hughes et al. and the Guide to IP Layer Network Administration disclose all of the limitations as described above except for having the memory internal or external to the processor. The general concept of placing the memory external or internal to a processor is well known in the art as illustrated by Bass et al. Bass et al. has memory external to the processors, but the combination of memory and processors create a network processor system (Abstract). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Hughes et al. and the Guide to IP Layer Network Administration with using memory external to

the processor and also internal to the entire network processor as taught by Bass et al. in order to create a network processor in one physical unit as to save money and space.

Regarding **claim 21**, Hughes et al. and the Guide to IP Layer Network Administration disclose all of the limitations as described above except for using a Direct Table and Patricia tree as the data structure. The general concept of using a Direct Table and Patricia tree is well known in the art as illustrated by Bass et al. Bass et al. discloses a frame lookup method using a Direct Table and Patricia Tree (column 25, lines 54-61). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Hughes et al. and the Guide to IP Layer Network Administration with using a Direct Table and Patricia tree as taught by Bass et al. in order to use known data structures to increase lookup speed of a packet and compatibility

11. **Claim 30** is rejected under 35 U.S.C. 103(a) as being unpatentable over Zenchelsky et al. (US 6,173,364 B1) in view of Lubkin et al. (US 5,339,435).

Regarding **claim 30**, Zenchelsky et al. discloses all of the limitations as described above except for deleting recently used entries when memory is full and a new entry needs to be added. The general concept of deleting entries to free memory and to replace the entries with new ones is well known in the art as illustrated by Lubkin et al. Lubkin et al. discloses a memory management system that deletes the entries when the cache is full and inserts a new entry as well (column 21, lines 3-6). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Zenchelsky et al. with this cache management as taught by Lubkin et al. in order to make use of memory as to increase capacity of the cache.

12. **Claims 33-35** are rejected under 35 U.S.C. 103(a) as being unpatentable over Hughes et al. (US 5,842,040) in view of TCP Protocol Specification.

Regarding **claim 33-35**, Hughes et al. disclose all of the limitations as described above including examining control bits in the TCP header as required by claim 33 (column 5, line 41, where the TCP flags are found in the TCP header), operating a calculation if the first state includes logical "0" as required by claim 34 (column 5, lines 45-47, where, Hughes et al. can examine the control bits and make sure they are in a certain range), and examine the specific control bits of SYN or FIN, as required by claim 35 (column 5, line 41). These flags control what the TCP packet is doing and examining them can let the system act accordingly. Hughes et al. does not disclose if a control flag is set to a certain state such as RST, then examining the length field in the IP header, multiplying the data offset field in the TCP header by 4, and then subtracting the result from the length field. The general concept of finding out the data location from information in a header and finding out the control bits from the header such as RST is well known in the art as illustrated by the TCP Specification. The TCP Specification describes that the actual data begins from the offset field in the TCP header (Page 16). As well known in the art, a processor that can examine TCP header information can also examine these length fields and determine where the TCP data begins. The TCP Specification also describes that SYN, FIN, and RST are related control bits (page 16). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Hughes et al. with finding the data starting location as taught by the TCP Specification in order to correctly find the location of the data, thus making the TCP data

available to the packet classifying system and making the system operate on more types of TCP packets.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Adam S. Weintrop whose telephone number is 571-270-1604. The examiner can normally be reached on Monday through Friday 7:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frantz Jules can be reached on 571-272-6681. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AW

FRANTZ JULES
SUPERVISORY PATENT EXAMINER

2/26/07